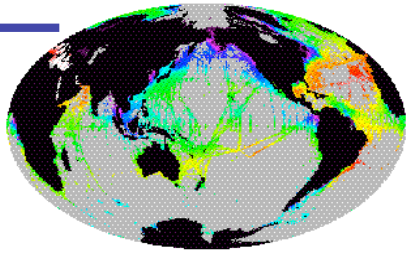
AQUARIUS Sea Surface Salinity

FACT SHEET

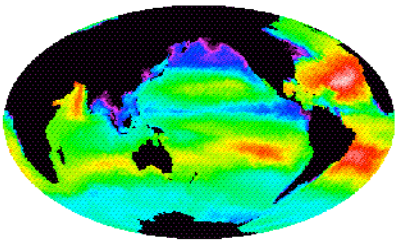
Understanding the Interactions Between the Global Water Cycle, Ocean Circulation and Climate

MISSION STATEMENT

Aquarius will provide unprecedented global maps of surface sea water salinity to discover how our oceans respond to climate change and the water cycle.



Routine Ship and Buoy Observations



ONE month of Aquarius

SCIENCE OBJECTIVES

"How are global precipitation, evaporation, and the cycling of water changing?"

Sea surface salinity is the primary surface tracer of freshwater input and output to the ocean associated with precipitation, evaporation, ice melting, and river runoff.

"How can climate variations induce changes in the global ocean circulation?"

Sea surface salinity, along with sea surface temperature, determines the sea surface density. This controls the formation of water masses in the ocean and regulates the 3-dimensional ocean circulation.

MISSION OBJECTIVES

The Aquarius mission will make new discoveries about the ocean and address two NASA Earth Science research priorities.

- ✓Produce global salinity maps at 0.2 psu accuracy on a monthly basis at 100-km resolution (1 psu = 1 g/kg salt concentration in seawater)
- ✓Enable discovery science
- ✓Measure the seasonal and year-to-year variations, as well as the global annual mean
- ✓Chart the seasonal variation in sea surface salinity

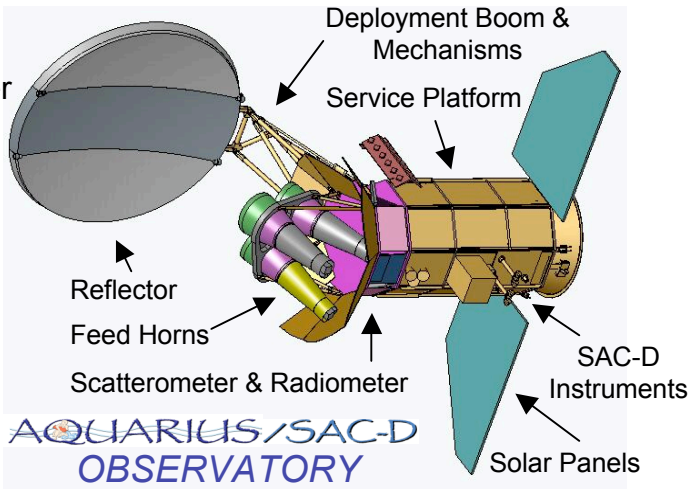
INSTRUMENTS

Aquarius Instrument (NASA):

- ✓Passive Salinity Sensor L-Band Radiometer operating at 1.4 GHz
- ✓Active Surface Roughness sensor L-Band Scatterometer operating at 1.2 GHz, using real aperture and a 3-meter composite reflector antenna

SAC-D Instruments:

- ✓NIRST, HSC, MWR, DCS **(CONAE)**
- ✓ROSA **(ASI)** & SODAD **(CNES)**



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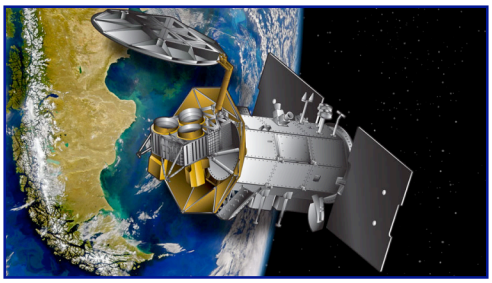
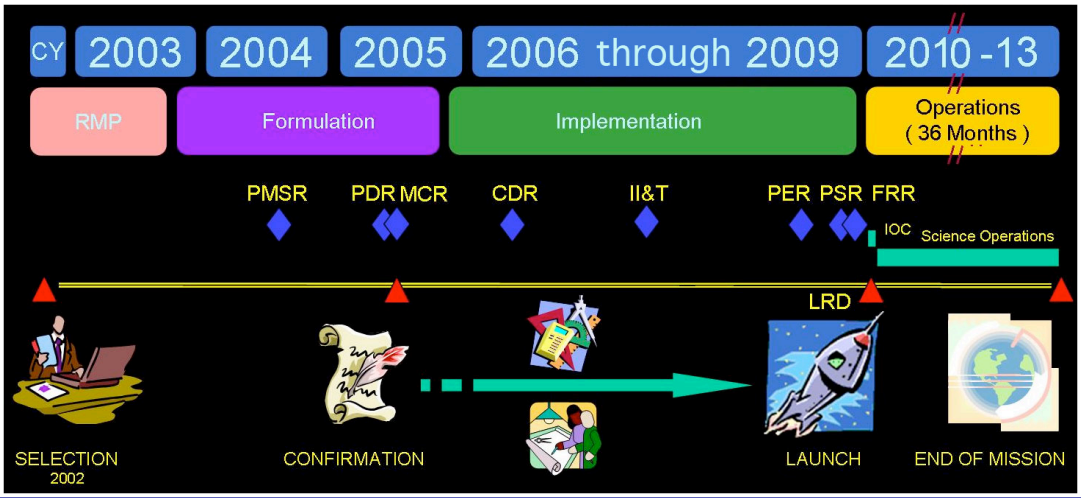
MISSION CONCEPT



Part of NASA's Earth System Science Pathfinder (ESSP) Mission
International Partnership between NASA & CONAE
Instrument Mode: Active/Passive L-band, Push-broom measurement approach using 3-beam, offset antenna
Orbit: 630km, 6 am sun synchronous @ 6am, ascending node
Observatory: CONAE (Comisión Nacional de Actividades Espaciales) contributes SAC-D (Satelite de Aplicaciones Cientificas) Service Platform and Ground Station
Attitude & Orbit Control: Three axis stabilized, nadir pointing; maneuvering thrusters
Observatory Mass: 1230 kg (spacecraft 850kg, payload 380kg)
Observatory Dimensions (launch config): 2,7m (diameter) x 4,5 m
Power Generation: 1365 Watts (EOL)
Communications: S Band Up and Downlink; X Band Data downlink
Operational life: 3 years (Aquarius); 5 years (S/P & SAC-D Instruments)
Launch date: May 2010 (VAFB)
Launch Vehicle: Boeing Delta II 7320-10 Launch Vehicle
Launch Site: Vandenberg Air Force Base (VAFB), California, USA
Science Products: 8-day, Monthly and Yearly Global Maps
Data Availability: Through PO.DAAC (NASA/JPL)
WWW Home Page: http://aquarius.gsfc.nasa.gov

TIMELINE



TEAM PARTNERS

Aquarius PI: G. Lagerloef (ESR); **DPI:** D. Le Vine (GSFC); **Project Scientist:** Y. Chao (JPL)
Aquarius Program Scientist: E. Lindstrom (NASA Hq); **SAC-D PI:** R. Colomb
25 Member International Science Team
Aquarius PM: A. Sen (JPL); **SAC-D PM:** L. Genovese (CONAE)
NASA Program Management: M. Tanner (NASA Hq), S. Bard (JPL)

NASA JPL ESR CONAE NOAA

Goddard Space Flight Center NASA